## **INDEX**

TO THE

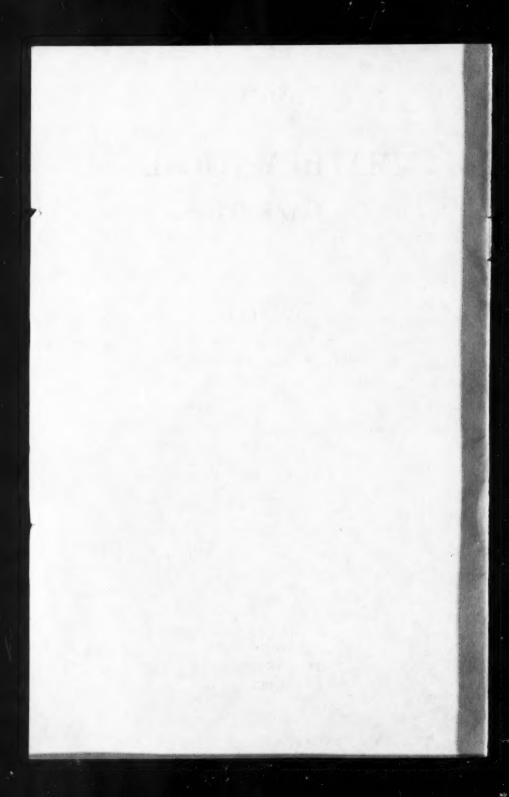
# MATHEMATICAL GAZETTE

# VOL. LVI

FEBRUARY 1972 TO DECEMBER 1972 (Nos. 395-398)

FIFTEEN PENCE NET

LONDON G. BELL AND SONS, LTD. 1972



# THE MATHEMATICAL GAZETTE

# VOL. LVI

FEBRUARY 1972 TO DECEMBER 1972 Nos. 395-398

> LONDON G. BELL AND SONS, LTD. 1972

# MATHEMATICAL GAZETTE

## INDEX

TO THE

# MATHEMATICAL GAZETTE

Vol. LVI

1972

No.	DAT	E	PAGES
395	February	1972	1-86
396	May	1972	87-178
397	October	1972	179-266
398	December	1972	267-364

Articles
Classroom Notes
Mathematical Notes
Correspondence
Miscellaneous
Reviews

#### ARTICLES

AUTHOR	TITLE	PAGE
John D. Baum	An arithmetic method in symbolic logic	91
B. T. Bellis	Whatever next (Presidential Address, 1972)	179
W. Antony Broomhead	Pascal $\pmod{p}$	267
R. P. Burn	The seven point plane	20
S. N. Collings	Further logic diagrams in various dimensions	309
H. R. Corbishley	Improving direct iteration	110
M. L. Cornelius	The transition from school to university mathematics	207
M. D. Dampier	An algebraic theorem related to the theory of relativity	292
P. G. Dean	Numerical methods and the computer	15
J. A. Dunn & J. E. Pretty	Halving a triangle	105
P. J. Giblin	What is an asymptote?	274
R. L. Goodstein	The fundamental formula in the algebra of sets	199
P. B. Goodwin	A simple visual solution of the technique of	
	undetermined multipliers	27
Cecil G. Gray	Solids of constant breadth	289
Michael Holt	Paper logic machine	25
T. Kiang	An old Chinese way of finding the volume of a sphere	88
C. J. Lawrance &	Stereoscopic scatter diagrams for illustrating	
R. Webster	population distributions	95
P. M. Lawrence	An algebraic approach to some pouring problems	13

AUTHOR	TITLE	PAGE
R. R. Laxton & J. A. Anderson	Linear recurrences and maximal length sequences	299
Hans Liebeck	The vector space axiom $1v = v$	30
J. H. Mason	Can regular tetrahedra be glued together face to	
	face to form a ring?	194
Timothy Murphy	The dissection of a circle by chords (see also p. 235)	113
F. O'Hara	A 24-point sphere for the orthocentric tetrahedron	295
S. L. Parsonson	Comparison of first-year university mathematics	
	syllabuses (Universities and Schools Committee)	2
D. C. D. Potter	Triangular square numbers (see also p. 311)	109
C. J. Priday	Card trick for Christmas	18
John E. Prussing	A nonrelativistic analogy to relativistic time dilatation	197
B. C. Rennie	Chains and whips in the teaching of mathematics	271
J. F. Rigby &	Non-commutative associative operations, and a	
James Wiegold	non-commutative group structure on the reals	33
R. E. Scraton	On divergent series	99
P. Shiu	How slowly can a series converge?	285
Graham S. Smithers	Early warning: a statistical classroom experiment	188
E. B. C. Thornton	Mysterious e	103
Universities and Scho	ols Committee (see S. L. Parsonson)	
E. M. Williams	Curriculum for the '70s (a synopsis) (see also p. 236)	5
	Triangular square numbers: a postscript	311

#### CLASSROOM NOTES

February	1972	259
May	1972	260-266
October	1972	267-275
December	1972	276-279

AUTHOR	No.	TITLE	PAGE
C. F. Fisher	267	All complex numbers are real	218
C. F. Fisher	276	Not all complex numbers are real, after all	315
F. Gerrish	279	Construction of defective 3×3 matrices having	
		prescribed eigenvalues and eigenvectors	318
L. R. Goide	266	On Classroom Note 241 (Pythagorean triples)	123
R. L. Goodstein	262	A property of the central conic	117
P. Holmes	259	The Poisson distribution as the limit of the binomial	35
E. H. Lockwood	274	Probability of acute-angled triangles	
		(spherical version)	222
J. R. Manning	273	Probability of acute-angled triangles	222
M. A. Mustafa & M. Planitz	272	No more than a ring	222
T. Nakazawa	275	A parabola property	223

AUTHOR	No.	Terre	PAGE
Brian Newbould	278	Trigonometrical triangles	316
C. Stanley Ogilvy	260	Curvature (see also p. 315)	116
C. Stanley Ogilvy	268	The equation $a \cos \phi + b \sin \phi = c$	219
C. A. Parrack	271	Perpetual motion?	221
D. A. Quadling	269	The re-klein-ing group	219
B. C. Rennie	265	Relative velocities without arrows	122
F. Rhodes	277	Curvature	315
W. G. Rosser	263	A rearrangement analogy	118
Alex Shannon	261	Construction of the 59th icosahedron	116
David J. Simpson	270	Equality of fractions	220
H. A. Thurston	264	How good is the usual approximation for the	
		period of a simple pendulum?	120

#### MATHEMATICAL NOTES

 February
 1972
 3317-3321

 May
 1972
 3322-3329

 October
 1972
 3330-3336

 December
 1972
 3337-3340

Author	No.	TIPLE	PAGE
R. T. Atherton	3325	The Mann-Whitney U test	127
Michael Behrend	3323	Duplicating the cube	125
W. Antony Broomhead	3328	Squares in a square lattice	129
R. J. Cornish	3332	A geometrical problem from engineering	225
D. B. Eperson	3336	Cubics with real roots	232
Harley Flanders	3324	Concurrent circles of equal radii	126
F. Gerrish	3318	Evaluation of a general nth-order determinant	38
F. Gerrish	3329	Faà di Bruno's formula	130
F. Gerrish	3319	Sledge-hammer cracks peanut	38
S. L. Gupta	3326	An identity involving the sum of the kth	
-		powers of the first n natural numbers	128
V. C. Harris	3317	Has anyone seen my curve? (see also p. 322)	37
S. N. Higgins	3334	Diabolic squares	228
G. H. Lawden	3338	Pascal matrices	325
John Leech	3330	The moon is denser than the sun	223
E. H. Lockwood	3335	Pascal's triangle and the trigonometrical	
		expansions	229
R. P. Loh	3322	Approximate angle trisection	124
Robert R. Loh	3322	Approximate angle trisection	123
H. V. Lowry	3331	Formula for $\pi/4$	224
Leslie Mustoe	3327	Addendum to Note 3281 (Construction of a	
		square using compasses only)	129
D. A. Quadling	3337	Dr. Harris's trisectrix	322

V1	THE	MATHEMATICAL GAZETTE	
AUTHOR	No.	Title	PAGE
R. Shail	3339	An electrostatic proof of the inversive	
		distance inequality	328
L. R. Shenton	3320	On Note 3280 and Faa di Bruno's formula	39
P. Shiu	3333	A generalization of some convergence tests	227
M. R. Spiegel	3340	The Laplace transform of $J_n(t)$	329
	3321	Statistical tables: an offer	39
		CORRESPONDENCE	
AUTHOR		Торіс	PAGE
W. Antony Broomhead	Progr	ess in congress?	331
J. M. Chiek	When	e are all the numbers?	330
P. Nsanda Eba	Tesse	llations with pentagons	333
Donald B. Eperson	The s	um of three consecutive squares	132
Dianne Fuller & Derek Wise	Geobo	pard geometry	234
S. L. Green	Revie	w correction	235
M. Lewin	When	is a direct proof indirect?	131
G. Merlane	The li	near equations problem	133
M. M. Risueño	Tesse	llations with pentagons	332
E. M. Williams & E. J. James	Revie	w comment	40
S. George Young	Frida	y 13th	133
		MISCELLANEOUS	
		111001111111111111111111111111111111111	
Corrections			235
	tics (Tes	ching): results of 1971 examination	178
With our thanks	; Welcon	me	1 87
Gleanings far and nee	Ar .	36, 40, 49, 86; 134, 178; 233,	
		REVIEWS	
	(* denot	es new edition; † denotes reprint)	

AUTHOR	TITLE	REVIEWER	PAGE
J. Aitchison	Statistics II	Alan Sherlock	250
G. Alexits & S. B. Stechkin (Ed.)	Proceedings of the Conference on Constructive Theory of Functions	R. L. Goodstein	361
Marie Anderson	A First Course in Modern Mathematics, Vol. 3	N. P. Payne	46

AUTHOR	Title	REVIEWER	PAGE
A. D. Angus	The Computer People	F. R. A. Hopgood	63
A. K. Aziz (Ed.)	Lecture Series in Differential		
UTV TO	Equations, Vol. II	F. Smithies	169
J. K. Backhouse &	Pure Mathematics: a First Course*	Short notice	364
S. P. T. Houlds-			
worth			
H. F. Baker	An Introduction to Plane		
	Geometry†	Short notice	266
Richard Bamberger et al.	Physics through Experiment	J. S. Fowlie	252
S. Barnett & C. Storey	Matrix Methods in Stability Theory	H. H. Robertson	80
Margaret E. Baron	The Origins of the Infinitesimal		
	Calculus	P. J. Wallis	57
J. Bass	Cours de Mathématiques, Vol. 3	T. A. A. Broadbent	259
Otto C. Bassler &	Learning to Teach Secondary		
John R. Kolb	School Mathematics	Alan J. Bishop	336
E. M. L. Beale	Applications of Mathematical		
(Ed.)	Programming Techniques	Susan Powell	79
Richard Bellman	Introduction to Matrix Algebra*	D. Rees	78
T. A. Bick	Introduction to Abstract		
	Mathematics	R. L. Goodstein	163
Claude Birtwistle	Mathematical Puzzles and		
	Perplexities	John Parker	345
L. M. Blumenthal	Theory and Applications of		
	Distance Geometry†	E. J. F. Primrose	160
L. M. Blumenthal & K. Menger	Studies in Geometry	J. A. Todd	261
R. M. Blumenthal	Markov Processes and Potential		
& R. K. Getoor	Theory	M. S. Bartlett	84
I. M. Bochenski	A History of Formal Logic†	R. L. Goodstein	165
R. L. Bolt	Examples in Statistics	Alan Sherlock	250
M. M. Botvinnik	Computers, Chess and Long-range		
	Planning	F. R. A. Hopgood	64
J. R. Branfield	Matrices	G. Merlane	143
J. R. Branfield & A. W. Bell	Matrices and their Applications	Geoffrey Matthews	143
F. Brauer &	Ordinary Differential Equations,		
J. A. Nohel	a first course	D. F. Mayers	76
F. Brauer &	Problems and Solutions in		
J. A. Nohel	Ordinary Differential Equations	D. F. Mayers	77
Arne Broman	Introduction to Partial Differential		
	Equations from Fourier Series	101	1.1.0
1111	to Boundary-value Problems	Bertha Jeffreys	76
M. Bruckheimer & A. Steward	Sampling Inspection	Alan Sherlock	250

AUTHOR	TITLE	REVIEWER	PAGE
W. Bulgren	A Computer Assisted Approach to		
	Elementary Statistics	G. A. Barnard	361
David M. Burton	A First Course in Rings and Ideals	E. M. Patterson	170
J. C. Butcher (Ed.)	A Spectrum of Mathematics	R. L. Goodstein	358
P. A. Caine	Statistics and Probability	D. A. Quadling	53
A. J. Cameron	A Guide to Graphs	J. L. G. Pinhey	43
George S. Carr	Formulas and Theorems in Pure Mathematics*	E. A. Maxwell	50
C. W. Celia	Introduction to Numerical Analysis	P. E. Gill	175
J. B. Channon.	New General Mathematics.		-10
A. McLeish	Book 3	D. M. Hallowes	238
Smith &			
H. C. Head			
K. L. Chung	A Course in Probability Theory	J. F. C. Kingman	67
H. T. Clark	Mathematics and Nature	John Denniss	339
J. Clay &	Modern Mathematics Revision	Short Notice	364
A. R. Trippett			
Frank L. Cleaver &	Precalculus Algebra and		
Walter E.	Trigonometry	D. A. Quadling	347
Williams			
L. Coddington	Quick COBOL	G. Gerrard	152
I. B. Cohen	Introduction to Newton's	ar derrara	102
at Di Conon	Principia	T. A. A. Broadbent	257
H. T. Combe	Relations and Functions	G. Merlane	141
H. T. Combe	Sets and Symbolic Logic	R. L. Goodstein	164
M. Combes	Fondements des Mathématiques	R. L. Goodstein	166
Committee on	Selected Topics in Algebraic		
Rational	Geometry	J. A. Todd	262
Transformations	Goomowy	0 1 12 1 2 0 0 0	202
Louis Comtet	Analyse Combinatoire	Hazel Perfect	73
R. N. Copley,	Pergamon Modern Mathematics.	1144001 0.5000	
P. S. W. Mac-	Book 1	G. Merlane	142
Ilwaine &	2700% 1	0. 140/10/10	142
C. Plumpton			
R. M. Cormack	The Statistical Argument	G. Smithers	148
D. R. Cox	0	J. F. C. Kingman	67
R. H. Crowell & W. E. Slesnick	Calculus with Analytic Geometry	E. H. Lockwood	244
Philip C. Curtis, Jr.	Calculus, with an Introduction to Vectors	F. Gerrish	352
A. Dakin &	Elementary Analysis*	E. A. Mazwell	51
R. I. Porter	The state of the s		01
D. T. Daniel	Secondary Certificate Mathematics		
art & transition		J. S. Fowlie	140
James W. Daniel &		U.S. A VIVIII	110
Ramon E. Moore		D. A. Quadling	53

AUTHOR	Trees	REVIEWER	PAGE
John D'Arey & Graham A. Knox	We're Going Metric	D. A. Quadling	52
F. N. David	A First Course in Statistics	Alan Sherlock	251
F. N. David,	Symmetric Functions and Allied		
M. G. Kendall & D. E. Barton	Tables	B. E. Cooper	69
H. Delong	A Profile of Mathematical Logic	R. L. Goodstein	61
L. C. W. Dixon	Nonlinear Optimization	R. Fletcher	363
Arthur H. Douglas	An Approach to Engineering Mathematics	J. M. Prentis	151
I. J. Douglas & J. D. G. Crichton	Engineering Mechanics	H. J. Matthews	342
S. M. Dowdy	Mathematics. Art and Science	R. L. Goodstein	163
D. M. Dribin	Elements of Pre-Calculus  Mathematics	W. L. Ferrar	71
C. V. Durell	Certificate Mathematics.	W. D. Perrur	11
C. V. Duren	Volumes 1 and 2*	E. H. Lockwood	343
C. V. Durell	Certificate Mathematics.	E. 11. 120000000	340
C. V. Duren	Volumes 3 and 4*	D. M. Hallowes	135
J. H. Durran	SMP Statistics and Probability	P. M. Lee	249
A. F. Edwards	Mathematics—Modern Style,	I . M. 1000	240
ZI. I'. LIGHWOLUS	Book 2	J. L. G. Pinhey	44
James Eells, Jr.	Singularities of Smooth Maps	Elmer Rees	74
Charles Vander.	Number Theory: an Introduction		
Email	to Proof	J. V. Armitage	162
C. E. L. F. T	Challenging Maths. 3	N. P. Payne	47
M. C. Swase & J. W. Baxte			
Orin J. Farrell & Bertram Ross	Solved Problems in Analysis	A. Erdélyi	354
William Feller	An Introduction to Probability		
	Theory and its Applications,		
	Vol. II*	David Kendall	65
H. G. Flegg	Boolean Algebra	R. L. Goodstein	61
K. R. Fogelman	Piagetian Tests for the Primary School	J. R. Branfield	41
J. Foley et al.	Individualizing Mathematics	T. M. Murray Rust	349
R. W. Fox	Certificate Mathematics. Book I*	E. H. Lockwood	243
R. W. Fox	Certificate Mathematics. Book II*	N. P. Payne	46
John B. Fraleigh	Probability and Calculus: a brief introduction	Alan Sherlock	149
P. French	Exploring Mathematics: Curves	E. H. Lockwood	43
Aaron J. Friedland	Puzzles in Math and Logic	John Parker	345
R. O. Gandy &	Logic Colloquium '69	R. L. Goodstein	164
C. M. E. Yates (Ed.)			
P. Gant	Mechanics*	E I Monaus	253
r. Gant	Mocments.	F. J. Tongue	203

AUTHOR	TITLE	REVIEWER	PAGE
Martin Gardner	Sixth Book of Mathematical Games		
	from Scientific American	D. A. Quadling	346
Saul I. Gass	An Illustrated Guide to Linear		
	Programming	Atam Vetta	247
Michael C. Gemignani	Axiomatic Geometry	E. J. F. Primrose	159
Michael C. Gemignani	Calculus and Statistics	Alan Sherlock	149
C. F. Gerald	Applied Numerical Analysis	A. J. Burton	86
Georges Glaeser	Mathématiques pur l'élève professeur	E. J. F. Primrose	160
M. Goldman	Introduction to Probability and	19. 0 . 1 . 1 Timi Occ	100
	Statistics	J. F. C. Kingman	67
James Gow	A Short History of Greek		
	Mathematics†	E. A. Maxwell	52
André Gramain	Topologie des Surfaces	E. J. F. Primrose	265
H. Grassmann	Mathematische Werke, 1†	J. A. Todd	262
I. Grattan-Guinness	The Development of Foundations of Mathematical Analysis from		
	Euler to Riemann	T. A. A. Broadbent	57
S. L. Green	Advanced Level Applied Mathematics* (see also p. 235)	D. M. Hallowes	49
H. Griesel	Analysis II	E. J. F. Primrose	161
M. A. R. Gunston	Practical Matrix Algebra	G. T. Symm	71
F. M. Hall	An Introduction to Abstract		
	Algebra*	Short notice	364
R. Harris	Discovering and Using $\pi$	D. M. Hallowes	136
R. E. Harris	Cornerstone Mathematics, Books 1, 3*	P. S. W. MacIlwaine	45
William L. Hart	Preparation for Calculus	D. R. Dickinson	138
B. Hartley &	Rings, Modules and Linear	2-12112-1001110011	200
T. O. Hawkes	Algebra	E. M. Patterson	73
L. Clark Hay	From Arithmetic to Algebra	S. L. Parsonson	46
J. Heading	Ordinary differential equations	R. F. D. Ranzetta	351
C. R. Heathcote	Probability: Elements of the		N.
	Mathematical Theory	R. L. Tweedie	173
L. L. Helms E. M. Hemmerling	Introduction to Potential Theory Fundamentals of College	D. E. Edmunds	83
	Geometry*	J. F. Rigby	159
Raymond S. Heritage	Learning Mathematics. Book 3*	N. P. Payne	146
I. N. Herstein & Reuben Sandler	Introduction to the Calculus	J.S. Fowlie	139
Edgar P. Hickman	Probability and Statistical		
& James G. Hilton		C. P. Chalmers	362
K. E. Hirst	Calculus of one variable	R. F. D. Ranzetta	351

AUTHOR	TITLE	REVIEWER	PAGE
K. E. Hirst & F. Rhodes	Conceptual Models in Mathematics	R. L. Goodstein	260
Harry Hochstadt	The Functions of Mathematical		
10	Physics	A. Erdélyi	354
E. D. Hodge & W. G. J. Wood	Applied Mathematics. SI Units*	F. Chorlton	48
F. R. Hodson,	Mathematics in the Archaeological		
D. G. Kendall & P. Tăutu (Ed.)	and Historical Sciences	T. A. A. Broadbent	340
K. Hoffman &	Linear Algebra*	W. L. Ferrar	262
H. Kunze			
Alan Holden	Shapes, Space and Symmetry	John Herses	338
R. D. Hollands	Modern Mathematics for Parents		
	and Teachers	Geoffrey Matthews	144
Ross Honsberger	Ingenuity in Mathematics	T. A. A. Broadbent	60
Keith Hope	Methods of Multivariate Analysis	Hilda M. Davies	68
A. F. Horadam	A Guide to Undergraduate		
	Projective Geometry	E. A. Maxwell	261
Frank M. Hudson & Donald W. Adlong	Introduction to Mathematics	Geoffrey Matthews	144
Ann Hughes &	Statistics: a Foundation for		
Dennis Grawoig	Analysis	L. E. Ellis	251
J. Hunter & D. Monk	Algebra and Number Systems	A. O. Morris	341
J. A. H. Hunter	Figures for Fun*	Short Notice	364
Harold R. Jacobs	Mathematics; a Human Endeavor	Alan Tammadge	156
D. H. Jacobson & D. Q. Mayne	Differential Dynamic Programming	H. H. Rosenbrock	78
E. J. James	Oxford Secondary Mathematics.		
	Books 1, 2, 3	Geoffrey Matthews	238
G. J. O. Jameson	A First Course on Complex		
	Functions	S. L. Green	74
C. M. Jessop	A Treatise on the Line Complex†	J. A. Todd	262
Harry H. Jonas	Pre-algebra	D. A. Quadling	347
W. Kaplan &	Calculus and Linear Algebra,		
D. J. Lewis	Volume 2	W. L. Ferrar	71
F. W. Kellaway (Ed.)	Metrication†	E. A. Maxwell	52
J. T. Knight	Commutative Algebra	V. Snaith	265
A. N. Kolmogorov 8. V. Fomin	Introductory Real Analysis	D. J. H. Garling	75
R. G. Krutchkoff	Probability and Statistical		
	Inference	J. F. C. Kingman	67
O. A. Ladyzhens-	The Mathematical Theory of	and a section of	
kaya	Viscous Incompressible Flow*	K. Stewartson	83
I. Lakatos &	Criticism and the Growth of		
A. Musgrave (Ed.)	Knowledge	T. A. A. Broadbent	59

AUTHOR	TITLE	REVIEWER	PAGE
S. H. Lamb	Harrap's Book of Mathematical		
	Tables and Definitions*	D. M. Hallowes	50
Serge Lang	Basic Mathematics	D. A. Quadling	347
Serge Lang	Introduction to Linear Algebra	J. S. Fowlie	56
Max D. Larsen	Fundamental Concepts of Modern		
	Mathematics	Geoffrey Matthews	145
Max D. Larsen &	Essentials of Precalculus		
Richard J. Shumway	Mathematics	D. A. Quadling	347
W. I. Layton	College Arithmetic*	D. A. Quadling	347
S. Lefschetz	Selected Papers	J. A. Todd	262
Walter Leighton	Ordinary Differential Equations*	R. P. Gillespie	167
G. Leitmann (Ed.)	Topics in Optimization	C. Storey	81
John D. Leonard &	Beginning Mathematics for College		
Blaine A. Warner		D. A. Quadling	347
J. M. Leonard	Statistics. The Arithmetic of		
	Decision-Making	J. L. G. Pinhey	147
Arnold Levine	Theory of Probability	J. F. C. Kingman	177
J. Parry Lewis	An Introduction to Mathematics		***
	for Students of Economics*	Freda Conway	245
Pamela Liebeck	Vectors and Matrices	Hugh Neill	253
Carl E. Linderholm	Mathematics Made Difficult	D. A. Quadling	255
D. G. H. B. Lloyd	Modern Syllabus Algebra	S. N. Collings	157
D. W. Long	Critical Path Analysis	G. Smithers	246
F. Loonstra	Introduction to Algebra	Peter Graham	72
Thomas J. McHale & Paul T. Witzke	Basic Algebra	D. A. Quadling	347
Jerry A. McIntosh	Perspectives on Secondary		
	Mathematics Education	Geoffrey Matthews	145
O. P. Malhotra &	A Complete Course in Additional		
Sushil K. Gupta	Mathematics with Statistics	E. H. Lockwood	344
D. E. Mansfield	Modular Arithmetic	D. A. Quadling	53
D. E. Mansfield &	Mathematics: A New Approach.		
D. Thompson	Book 3	G. Smithers	246
L. March &	The Geometry of Environment. An		
P. Steadman	Introduction to spatial organiza-		
	tion in design	T. A. A. Broadbent	154
L. Marder	Calculus of Several Variables	R. F. D. Ranzetta	351
L. Marder	Vector Algebra	R. F. D. Ranzetta	351
Mathematics for the	Majority Project:		
	Number Appreciation )		
	Luck and Judgement	A. W. Riley	237
	Mathematical Pattern		
W. H. Matthews	Mazes and Labyrinths	E. A. Maxwell	52
C. R. F. Maunder	Algebraic Topology	W. H. Cockeroft	171
James J.	Beginning Algebra for Mature		
Meadowcroft II	Students	D. A. Quadling	347

Ачтнов	TITLE	REVIEWER	PAGE
R. G. Meadows &	Advanced Pure Mathematics: a		
R. Delbourgo	revision course	F. G. J. Norton	344
B. Meltzer & D. Michie (Ed.)	Machine Intelligence 6	F. R. A. Hopgood	176
C. J. Merchant	Contemporary Intermediate Algebra	D. M. Hallowes	137
B. E. Meserve & J. A. Izzo	Fundamentals of Geometry	J. W. Hesselgreaves	70
Ancel C. Mewborn	A Programmed Course in Algebra	E. H. Lockwood	343
	tical Experiment (MME):		
	Vol. I, Part B; Vol. II (GCE),		
	Part A; Vol. II (CSE), Part A	J. R. Branfield	41
	Vol. II (GCE), Part B	G. Smithers	42
	Vol. II (GCE), Part C	J. R. Branfield	341
Marvin Minsky	Form and Content in Computer	o t an arthur	-
Mai vin Millony	Science	Alan Sutcliffe	64
L. Mirsky (Ed.)	Studies in Pure Mathematics	R. L. Goodstein	62
A. J. Moakes,	Pattern and Power of Mathematics.	21. 22. 000000000	02
P. D. Croome &	Book 6	S. L. Parsonson	45
T. C. Phillips			
David C. Murdoch	Linear Algebra	E. J. F. Primrose	161
Evar D. Nering	Linear Algebra and Matrix Theory*		161
E. H. Neville	Elliptic Functions: A Primer	I. W. Busbridge	355
J. Newson & M. Matthews	The Language of Basic Statistics	G. Smithers	148
Ivan Niven &	An Introduction to the Theory of		
Herbert S.	Numbers*	R. L. Goodstein	360
Zuckerman		1011	
Richard L. Nolan	FORTRAN IV Computing and		
	Applications	T. P. Swetman	151
Nuffield Mathemati	cs Project:		
	Computers and Young Children	M. E. Wardle	357
	Logic	R. L. Goodstein	358
M. M. Ohmer	Mathematics for a Liberal Education	T. A. A. Broadbent	155
H. E. Parr	Revision Course in School Mathematics*	E. H. Lockwood	242
H. E. Parr	School Mathematics. Parts 1, 2*	E. H. Lockwood	241
H. E. Parr &	Modern Mathematics. Parts 1, 2*	G. Merlane	143
J. R. Shelley			_ 20
G. P. Patil (Ed.)	Random Counts in Models and		
G. I. FBUI (Eu.)	Structures	R. W. Horns	174
D. N. Paton	Multiple Choice 'Modern'	10. W. HUTTES	1/4
D. M. FROII	Mathematics	Short notice	364
R. S. Paul &	Contemporary Technical	SHOTE HOUSE	30%
M. L. Shaevel	Mathematics with Calculus	E. H. Lockwood	243
m. L. Simevel	madicinatios with Carolina	11. 11. LIOUKWOOG	243

AUTHOR	TITLE	REVIEWER	PAGE
D. Pedoe	A Course of Geometry for Colleges		
	and Universities	E. A. Maxwell	261
J. A. Peterson & J. Hashisaki	Theory of Arithmetic*	J. R. Branfield	159
Esther R. Phillips	An Introduction to Analysis and		
	Integration Theory	J. L. B. Cooper	263
Jean Piaget	Structuralism	Michael Holt	337
C. C. Pinter	Set Theory	R. L. Goodstein	360
R. L. Plackett	An Introduction to the Theory of Statistics	E. F. Harding	172
C. Plumpton &	Theoretical Mechanics for Sixth		
W. A. Tomkys	Forms. Volume 1*	F. Chorlton	150
C. Plumpton &	Theoretical Mechanics for Sixth		
W. A. Tomkys	Forms. Volume 2*	F. Chorlton	252
Murray H. Protter	College Calculus with Analytic		
& Charles B.	Geometry	Alan Barton	244
Morrey, Jr.			
Lennart Råde (Ed.)		a n a 1	
4 T D	Statistics	C. P. Chalmers	64
A. J. Raven	Metric Mechanical Mathematics	Short Notice	265
D. S. Riggs	The Mathematical Approach to Physiological Problems*	T M C	00
G. F. Roach	Green's Functions: Introductory	I. N. Sneddon	82
G. F. Bosch	Theory with Applications	L. E. Fraenkel	168
T. G. Room &	Miniquaternion Geometry	E. A. Maxwell	261
P. B. Kirkpatrick		251 221 212 (600-60-600	201
M. Rueff & M. Jeger	Sets and Boolean Algebra	R. L. Goodstein	60
School Mathematics	Project (SMP)		
5011001 31401103140300	Computing in Mathematics: Some		
	Experimental Ideas for Teachers	M. A. Bloxham	247
	Further Mathematics Series:		
	I Linear Algebra and Geometry	N D D	140
	II Vectors and Mechanics III Differential Equations and	N. P. Payne	146
	Circuits	E. D. Tagg	248
	IV Extensions of Calculus V Statistics and Probability	N. P. Payne	146
	Statistics and Probability (see J. H. Durran)		
	Teacher's Guide for Book 3T	D. T. Vigar	248
I. W. Scott &	Applied Mechanics through		
S. P. Methven	Worked Examples	D. M. Hallowes	50
Nicholas E. Scripture	Mind-Benders	John Parker	345
Scottish Mathematic	s Group (SMG):		
	Modern Mathematics for Schools:		
	Progress Papers 1	Short Notice	266

AUTHOR	TITLE	REVIEWER	PAGE
Samuel M. Selby & William H. Beyer	Modern Intermediate Algebra	D. A. Quadling	347
H. Shankar (Ed.)	Mathematical Essays dedicated to		
	A. J. Macintyre	E. M. Wright	153
Jesse M. Shapiro &	Elementary Analysis and	410000000	
D. Ransom	Statistics	Alan Sherlock	149
Whitney			
W. Shepherd	Shepherd's Golossary of Graphic		
and the same of	Signs and Symbols	T. A. A. Broadbent	154
G. E. Shilov	Linear Algebra	F. Rhodes	177
W. Sierpinski	250 Problems in Elementary	of the state of	
	Number Theory	R. L. Goodstein	162
G. E. Skipworth	Exercises and Worked Examples in		
G. 23. Daipworth	Statistics	Alan Sherlock	250
Donald Smeltzer	Man and Number*	R. L. Goodstein	61
Vladimir I. Smirnov	Linear Algebra and Group Theory	E. A. Maxwell	51
1.00	Formulation and Optimization of	are all materiores	01
Cecil L. Smith, Ralph W. Pike &	Mathematical Models	H. H. Robertson	81
Paul W. Murrill	mathematical models	H. H. Kooertson	91
C. V. Smith	World of Maths—In the Air	S. N. Collings	255
D. E. Smith	Rara Arithmetica	R. L. Goodstein	165
R. C. Smith & P. Smith	Mechanics*	Short Notice	266
K. S. Snell &	New Mathematics. Vol. 1*	N. P. Payne	47
J. B. Morgan		Digential Control	
K. S. Snell &	New Mathematics, Teacher's		
J. B. Morgan	Guide to Volumes I and II*	N. P. Payne	147
D. M. Y. Somer-	Bibliography of Non-Euclidean	Market and a second	
ville	Geometry*	E. J. F. Primrose	160
Barry Spain	Ordinary Differential Equations	R. P. Gillespie	77
L. Spector	Liberal Arts Mathematics	T. A. A. Broadbent	155
Donald D. Spencer	A Guide to BASIC Programming:		
	A Time-Sharing Language	R. E. Thomas	63
G. B. Standley	New Methods in Symbolic Logic	R. L. Goodstein	359
G. Stephenson	Inequalities and Optimal Problems		
	in Mathematics and the Sciences	D. A. Quadling	256
Catherine Stern & Margaret B. Stern	Children Discover Arithmetic*	R. L. Goodstein	259
K. A. Stroud	Engineering Mathematics.		
A. A. Buoud	Programmes and Problems	F. Chorlton	49
N. I. Styazhkin	History of Mathematical Logic	2.010/10/10	40
14. 1. DUJ BEHERIH	from Leibniz to Peano	R. L. Goodstein	61
A. Talbot (Ed.)	Approximation Theory	R. Fletcher	85
J. C. Tallack	Introduction to Vector Analysis	F. J. Tongue	253
S. J. Taylor	Exploring Mathematical Thought	Geoffrey Matthews	238
H. Teichmann	Physical Applications of Vectors	and the state of t	200
11. 100mmann	and Tensors	Bertha Jeffreys	254

AUTHOR	TITLE	REVIEWER	PAGE
R. Temam	Analyse Numérique	G. F. Miller	85
G. Temple	The Structure of Lebesgue		
	Integration Theory	T. M. Flett	264
R. M. Thrall & L. Tornheim	Vector Spaces and Matrices†	E. A. Maxwell	51
Dennis Thyer &	Teaching Mathematics to Young		
John Maggs C. Tomasso	Children A Practical Course in FORTRAN	Geoffrey Matthews	336
C. IOIII	IV	T. P. Swetman	151
C. Tomasso	A Practical Course in SL/1	Eileen M. Jones	152
Arthur Trewin	Mathematics with a Difference	Helen Bromby	156
Edward M. Tronaas	Mathematics for Technicians	D. A. Quadling	347
K. Trustrum	Linear Programming	Susan Powell	
B. A. Venkov	Elementary Number Theory	R. L. Goodstein	174
John Venn	Symbolic Logic†	Short notice	266
G. R. Walsh	An Introduction to Linear	Short notice	200
G. K. Waish		C D11	284
m ar ar	Programming	Susan Powell	174
T. H. Ward Hill	Metric Weights and Measures	D. A. Quadling	52
Magnus J. Wenninger	Polyhedron Models	D. A. Quadling	256
Peter Whittle	Probability	D. C. Handscomb	66
H. Widom	Lectures on Integral Equations	F. Smithies	169
H. Widom	Lectures on Measure and Integration	F. Smithies	169
Manmant V	Mathematics: The Alphabet of	F. Smillies	109
Margaret F. Willerding & Ruth A. Hayward	Science*	E. A. Door	339
Margaret F.	College Algebra and Trigonometry	D C W Marthuria	245
Willerding & Stephen Hoffman	Conege Aigeora and Trigonomenry	r.s. w. muchwame	240
H. K. Wilson	Ordinary Differential Ferrations	D 7 E Cal.	
	Ordinary Differential Equations	R. L. E. Schwarzen- berger	166
Noel Wilson	Objective Tests and Mathematical		
	Learning	J. G. Frith	55
E. O. Wolstenholme	Elementary Vectors*	S. N. Collings	255
R. Wood &	Item Banking	Alan Tammadge	55
L. S. Skurnik			
D. Young	Group Mathematics Test	J. S. Forolie	56
	Computers and Computation.  Readings from Scientific		
	American	J. D. Tinoley	356
	Intermediate Algebra: a Modern		
	Approach	D. A. Quadling	347
	Introductory Algebra: a Modern		
	Approach	D. A. Quadling	347
	Mathematics for Schools: A Modern Certificate Course. Books		
	A, B, C, D	T. J. Heard	239
	A, D, U, D	1.J. Heara	239

AUTHOR	TITLE	REVIEWER	PAGE
	Objective Tests in Mathematics	D. A. Quadling	54
	Problem Solvers (Series) Science and Synthesis (report of	R. F. D. Ranzetta	351
	a UNESCO colloquium)	T. A. A. Broadbent	258
	Symposia Mathematica, Vol. II	R. L. Goodstein	62
	Symposia Mathematica, Vol. VI	R. L. Goodstein	260
	Journals:		
	Conceptos de Matematica	Short notice	266
	Enquiry 1972	Short notice	364
	Geometriae Dedicata	Short notice	266
	Journal of Statistical Computation	1	
	and Simulation	Short notice	266
	Mathematical Programming	Short notice	266
	Newsmaths	H. C. Wood	135
	Printout	Short notice	266
	Problems of Control and		
	Information Theory	Short notice	266
	School Technology	Short notice	266



# the mathematical gazette

The Journal of the Mathematical Association



Volume LVI: Number 395

February 1972

G. BELL and SONS LTD., Portugal Street, London W.C.2A 2HL

£1.00 net BELL

### THE MATHEMATICAL ASSOCIATION

AN ASSOCIATION OF TEACHERS AND STUDENTS
OF ELEMENTARY MATHEMATICS

'I hold every man a debtor to his profession, from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavour themselves by way of amends to be a help and an ornament thereunto.'

BACON

#### PRESIDENT

Mr. B. T. Bellis, M. A.

#### VICE-PRESIDENTS

Dr. I. W. Busbridge Mr. R. E. Green Dame Mary Cartwright, Lady Jeffreys D.B.E., F.R.S. Mr. F. W. Kellaway Mr. J. T. Combridge Mr. W. J. Langford Miss W. A. Cooke Prof. Sir James Lighthill, F.R.S. Prof. C. A. Coulson, F.B.S. Dr. E. A. Maxwell Mr. J. B. Morgan Dr. W. L. Ferrar Prof. M. H. A. Newman, F.R.S. Prof. V. C. A. Ferraro Prof. R. L. Goodstein Mr. K. S. Snell

Mrs. E. M. Williams
HONORARY TREASURER

Mr. R. L. Lindsay

HONORARY ASSISTANT TREASURERS
Mr. N. De Q. Dodds, Mr. D. H. Halfpenny

HONORARY SECRETARIES

Miss R. K. Tobias Dr. A. G. Howson

HONORARY ASSISTANT SECRETARIES

Mr. K. A. J. Bermingham, Mr. B. Girling, Miss E. M. Holman, Miss A. Roberts, Mr. A. J. Sherlock, Miss N. L. Squire

THE TEACHING COMMITTEE

Chairman, Mr. C. A. R. Bailey

Honorary Secretary, Miss N. L. Squire.
3 Stanhope Gate, Ashburton Road, Southsea, Hants. PO5 3JS

HONORARY LIBRARIAN Prof. R. L. Goodstein

EDITORIAL BOARD

Mr. D. A. Quadling, Editor-in-Chief

Mr. P. Reynolds (Editor, *Mathematics in School*), Mr. W. A. Dodd (Editor of the Newsletter), Dr. A. G. Howson.

Editorial and Advertising correspondence relating to *The Mathematical Gazette* should be addressed as on the inside back cover.

